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NEW PLANT RECORDS FROM THE PLEISTOCENE

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The following notes refer to determinations of miscellaneous plants identified from small collections sent me at various times during the past few years, and coming from scattered localities in the southeastern United States. It is desirable to place these on record for the benefit of students of the life of the Pleistocene, and of the distribution of recent plants.

CORNFIELD HARBOR, MARYLAND

This historic locality has long been known for its Pleistocene molluscan remains. It is in southern St. Mary's County, and has furnished a considerable marine fauna.* The general stratigraphic relations are dark clays resting unconformably on the Miocene, becoming more sandy and oyster bearing upward, and overlain by non-fossiliferous sands, the whole belonging to the Talbot formation of the Pleistocene.

In 1909 Mr. James Hall of Cornfield Harbor sent me part of a log from the lower part of the dark shell bearing clay. The specimen is 52 inches long and 7 inches in diameter, and is clearly drift wood, since it is extensively *Teredo* bored. I am indebted to Dr. R. Thiessen of the Bureau of Mines for cutting and examining sections for me.

The log obviously belongs to *Juniperus*. The preservation is not perfect and in some of the anatomical features the structure departs from that characteristic of our widespread eastern *Juniperus virginiana* Linné, and resembles the western *Juniperus occidentalis* Hooker. It can hardly represent the latter species, and probably represents the former, although there is a possibility that it might represent the northern Holarctic *Juniperus communis* Linné, which has been recorded† recently from New York.

* Described in Maryland Geol. Survey Pleistocene, 1916.

† Hollick, A., Amer. Mus. Novitates 213, 1926.

In view of the relatively warm water character of the associated mollusca this is hardly probable.

American Pleistocene records of *Juniperus* comprise wood from the Don Valley in Ontario, and from Humboldt County, California; and seeds from the Talbot formation of New Jersey.

DISTRICT OF COLUMBIA

In an excavation on the southeast corner of North Capitol and Pierce Sts., Washington, N. E., a black muck with drift wood, of Talbot age, lies unconformably on the Potomac Cretaceous. Specimens of the wood, collected by Laurence La Forge, were sectioned and the wood determined to be that of the *Taxodium distichum*, the existing bald cypress. This species has been found fossil at numerous Pleistocene localities in the southeastern United States; and stumps in situ, seeds, and cone scales were common in the excavation at Connecticut Avenue and De Sales Street, N. W.* The present locality is a considerable distance northwest of the inland limit of range of this species at the present time.

At an excavation at 17th & K. Sts., Washington, N. W., from a carbonaceous muck of the same age as that encountered at Connecticut Ave., & De Sales St., that is, belonging to the Wicomico formation, Arthur Keith collected several characteristic husks and a nut of what proves to be *Hicoria ovata* Britton, (figures 5-7). This species has been recorded previously from the Pleistocene of Pennsylvania and North Carolina.

In the recent flora it is found from the valley of the St. Lawrence southward along the uplands to western Florida. In the latitude of the District of Columbia it does not occur in the Coastal Plain but is confined to the Piedmont and Mountain zones, although it is recorded from the Potomac valley within the northwestern limits of the District.

VIRGINIA

Messrs. Maddren, Messler and Mansfield of the U. S. Geological Survey collected cones of *Pinus echinata* Miller from the Talbot formation on the left bank of the Rappahannock River, 1½ miles below Taft P. O. in Lancaster County. This species

* Berry, E. W., Jour. Wash. Acad. Sci. 14: 15, pl. 1 figs. 37-42; pl. 3, 1924.

has been recorded previously from the Pleistocene of Maryland and Alabama.

TENNESSEE

A newly opened clay pit near Hilltop, between Paris and Whitlock, and about 2 miles south of the latter town, in Henry County, Tennessee, was studied during the past summer by R. Lee Collins. The clay is dark in color and full of roots and wood. The following plants, which are of considerable interest, were recognized from this deposit:

✓ PINUS TAEDA Linné. Figs. 8, 9

Berry, A. Jour. Sci. 29: 391. 1910; Torrey, 10: 263, 1910; Jour. Geol. 25: 662, 1917; 9th Ann. Rept. Fla. Geol. Survey, 20, 1917.

The loblolly pine is represented by cones, scales or seeds in the Pleistocene of New Jersey, Florida and Alabama. There are two specimens of cones in the present collection which certainly belong to this species. I have compared the fossils with a series of cones of recent species and the only other modern form that resembles them are the cones of *Pinus caribaea* Morelet, the slash or swamp pine, of the present coastal region from South Carolina to Louisiana. In the latter the scales have more corrugated tips and the prickles are more slender. I have mutilated the larger fossil specimen sufficiently to get the full outline of one of the scales and there is no doubt but that it represents *Pinus taeda*.

In the recent flora this species extends from Cape May, N. J., southward in the Coastal Plain to peninsular Florida, and in the Gulf States to the valley of the Colorado River in Texas. It extends up the Mississippi valley to southern Arkansas and the southern boundary of west Tennessee. According to Mohr it rarely gets northward of this southern boundary, nor do I recall having seen it during long continued field work in that part of the state, so that the present fossil occurrence is about 100 miles north of its present northern limit of growth.

SCIRPUS OR CYPERUS

The collection contains 2 specimens of small lenticular achenes lacking their beaks. It is impossible to determine with certainty the genus of Cyperaceae to which they belong. They do not rep-

resent *Carex*, but similar fruits are present in some of the modern species of both *Scirpus* and *Cyperus*, to the one or the other of which I am convinced that these fossils belong.

SMILAX (?) sp. Figs. 10-13

There are a number of specimens of a small globular berry, about 4 millimeters in diameter, preserved in a more or less flattened condition. After extended comparisons with recent material I believe them to represent the genus *Smilax*, although it must be admitted that this cannot be conclusively demonstrated. The most similar fruits among existing species are those of *Smilax rotundifolia* Linné and *Smilax lanceolata* Linné, although unusually small fruited specimens of *Smilax walteri* Pursh are also similar. All three occur in western Tennessee at the present time, the first ranging from southern Canada to the Gulf of Mexico, the second from Virginia to Arkansas and southward, and the third from New Jersey to Tennessee and southward. The last is the only one of the three especially characteristic of swamps and wet pine lands. There is no evidence that the Pleistocene environment here was swampy, and my impression is that the fossils are closest to *Smilax lanceolata*, a dry woods type in the existing flora.

BRASENIA SCHREBERI Gmelin. Figs. 1-4

Brasenia peltata Pursh. Penhallow, Bull. Geol. Soc. Am. 1: 326. 1890.

Brasenia purpurea (Michx.) Caspary. Coleman, Idem., 26: 247. 1915: Berry, Jour. Geol. 25: 662. 1917; 9th Ann. Fla. Geol. Survey 26. 1917.

Our American water shield, a denizen of slow streams and ponds, is now usually given the above name, which we owe to Gmelin. It is considered to be the same as *Brasenia peltata* of Pursh and *Brasenia purpurea* (Michx.) Caspary. Its seeds are the most abundant fossils in this deposit, and they are indistinguishable from the seeds in existing material. They have been previously recorded from Ontario and Florida, and are interesting in the present instance in that they show that these clays were probably accumulated in a pond. Similar seeds have been recorded throughout the European Tertiary, and they are ex-

ceedingly common throughout the Pleistocene of Europe from Sweden and Finland to Italy where they are generally referred to under the name of *Brasenia purpurea*. A fairly complete discussion of them has been given by Stoller.*

In America the water shield is widely distributed in appropriate situations from Canada to Central America, and in the Atlantic and Pacific regions, and what systematists consider the same species occurs in similar environments on all of the continents except Europe, where it is no longer native.

This small florule is interesting in several ways: First, because of its occurrence in the center of a region of many and extensive clay workings of lower Eocene age, it being the only Pleistocene clay recognized along this upland ridge; Second, in showing no traces of oaks, beech or of the bald cypress which are so common in the Pleistocene deposits of southeastern North America; Third, in that the plants preserved are those of dry pine land (*Pinus taeda*), associated with pond or slow stream types, notably *Brasenia*, thus disclosing a fleeting picture of the Pleistocene environment in Henry County which is considerably different from that of the present in this region.

TEXAS

From a limonitic sandstone of Pleistocene age at a locality 2 miles northwest of Jacksonville in Cherokee County, Texas, Julia A. Gardner of the U. S. Geological Survey, collected the following species of plants:

FAGUS AMERICANA Sweet

This species is widespread in Pleistocene deposits, although it has never before been encountered as far west as this. It has been recorded from the Pleistocene of Massachusetts, Pennsylvania, Maryland, West Virginia, Virginia, North Carolina, Alabama, and Mississippi.

QUERCUS LYRATA Walt

This, like the associated fossil forms, is characteristic of deep and moist soils. In the recent flora it ranges from Maryland to Florida and Texas, reaching its maximum size in Louisiana and

* Stoller, J. Jahrb. k. Preuss. Geol. Landes. 29: 62-93. 1908; 32: 126. 1911.



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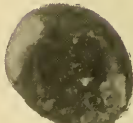
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east Texas. Both leaves and acorns have been found in the Pleistocene of North Carolina.

PERSEA BORBONIA Spreng (?)

Somewhat doubtfully determined leaves of this species occur at this locality. In the recent flora it ranges from Virginia to Florida and Texas. It has not certainly been found fossil before but allied *Persea pubescens* (Pursh) Sargent has been found in the Pleistocene of North Carolina and Alabama. The separation of the two on the basis of leaves alone is attended with some uncertainties.

Explanation of Plate

Figs. 1-4. *Brasenia schreberi* Gmelin. Seeds $\times 4$ from near Whitlock, Tenn.

Figs. 5-7. *Hicoria ovata* Britton, nat. size. Wicomico formation, 17th & K. Sts., Washington. 5. a nut, 6, 7. Outer and inner view of husks.

Figs. 8, 9. *Pinus taeda* Linné, nat size. From near Whitlock, Tenn. 8. A single scale from the outside, 9. Part of cone in matrix.

Figs. 10-13. *Smilax* (?) sp., $\times 4$, from near Whitlock, Tenn.

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NATURE TRAILS AT WALKING CLUB CAMPS

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Among a large number of outdoor study groups, throughout the United States, and even in Europe and Asia, which have adopted the methods of Dr. Frank E. Lutz, Curator of Entomology at the American Museum of Natural History, in labelling natural exhibits "in place," on Nature Trails, are two of the largest of the walking clubs of the New York City metropolitan district, the New York Section of the Green Mountain Club and the New York Chapter of the Adirondack Mountain Club.

Nature Trails have been started at the Wyanokie Lodge, the gathering place of the New York Section of the Green Mountain Club, three miles west of Wanaque-Midvale, in Passaic County, on the Greenwood Lake division of the Erie Railroad; and at Camp Thendara, the Section's all year camp on Lake Tiorati, in the Harriman State Park, nine miles southwest of Bear Mountain.